

CLAIMS

What is claimed is:

1. An apparatus to position a flexible strand in a tunnel, having a diameter, formed in a bone while performing a surgery, the apparatus comprising:

a guide member configured to hold a loop of the flexible strand;

a fixture coupled to the guide member defining a first bore and a second bore, said first bore having a first bore axis and said second bore having a second bore axis, both bore axis intersecting with the tunnel;

a soft tissue bearing support disposed within the first bore and the loop; and

a flexible strand bearing support disposed within the second bore and the loop.

2. The apparatus of claim 1, wherein the fixture comprises:

a first member and a second member positioned at approximately a right angle, wherein the first and second bore are formed at a terminal end of said first member, said second end of said guide member is adapted to be coupled to said second member; and

wherein said guide member and said first and second bores are generally aligned.

3. The apparatus of claim 2, further comprising a first tunnel forming device adapted to be received through said first bore and said guide member, wherein a tunnel formed by said tunnel forming device is generally aligned with said guide member and said first bore.

4. The apparatus of claim 3, further comprising a second tunnel forming device adapted to be received through said second bore and said guide member, wherein a tunnel formed by said tunnel forming device is generally aligned with said loop and said second bore.

5. The apparatus of claim 1, wherein said first and second bores are parallel.

6. The apparatus of claim 1, wherein said guide member defines an aperture which has internal dimensions substantially equivalent to said flexible strand.

7. The apparatus of claim 6, wherein the flexible strand is held over said guide member when the flexible strand is held in said aperture.

8. The apparatus of claim 1, wherein said guide member has a width substantially equal to the diameter of the tunnel in the bone.

9. The apparatus of claim 1, wherein the fixture comprises a first member and a second member positioned at approximately a right angle, wherein the first and second bores are formed at a terminal end of said first member and said second end of said guide member extends from a terminal end of said second member, and wherein said guide member and said first and second bores are generally aligned.

10. The apparatus of claim 1, further comprising first and second tunnel forming devices adapted to be received through said first and second bores and said guide member, wherein a tunnel formed by said first tunnel forming device is generally aligned with said guide member and is perpendicular to said tunnel.

11. An apparatus to place a loop of flexible strand in a tunnel, having a diameter, formed in bone while performing a surgery, the apparatus comprising:

- a first member having a first end and a second end spaced apart, said first end defining a guide member configured to hold the loop of flexible strand in a first plane;

- a fixture defining a pair of guide bores configured to guide a pair of tunnel forming devices through the guide bores along an axis perpendicular to the first plane;

- a flexible strand bearing element disposed through one of said bores and through the loop; and

- a soft tissue bearing element disposed through said loop.

12. The apparatus of claim 11, wherein the tunnel forming devices are adapted to be received through said first and second bores and said guide member, wherein tunnels formed by said tunnel forming devices are generally aligned with said guide member and are through the loop.

13. The apparatus of claim 11, wherein said first end of said first member has a width substantially equal to the diameter of the tunnel in the bone.

14. The apparatus of claim 11, where said fixture is generally L-shaped.

15. The apparatus of claim 11, wherein said first and second bores are generally parallel.

16. A method of surgically coupling a soft tissue replacement into a first tunnel defined within a bone comprising:

inserting an insertion rod comprising a guide member into the first tunnel, wherein a flexible strand is pre-loaded in the form of a loop onto said guide member;

forming a second tunnel transverse and through said first tunnel and said loop;

forming a third tunnel transverse and through said first tunnel and said loop;

placing a soft tissue bearing member through said second tunnel so as to transverse said first tunnel; and

placing a removable flexible strand bearing element through said third time so as to transverse said first tunnel.

17. The method of claim 16, further comprising affixing said insertion rod to an external fixture such that said insertion rod is aligned with said external fixture.

18. The method of claim 17, wherein the step of forming said second tunnel includes aligning a drill bit using said external fixture.

19. The method of claim 18, further comprising the step of forming said first tunnel in a first bone member.

20. The method of claim 16, further comprising the steps of:

affixing a soft tissue replacement to a first end of said flexible strand; and

pulling said soft tissue to the soft tissue bearing element in said first tunnel;

removing a flexible strand bearing element from the third tunnel;

pulling said soft tissue over said soft tissue bearing element in said first tunnel and back out said first tunnel; and

affixing the soft tissue to the bone.

21. The method of claim 16, wherein said step of forming said second tunnel comprises aligning a first tunnel forming device to form said second tunnel using said insertion rod.

22. The method according to claim 20 further including pulling said soft tissue from said soft tissue bearing element to said flexible strand bearing element.

23. The method of claim 20 further including injecting biological materials into the first tunnel.

24. The method according to claim 20 further including injecting biological materials through the third tunnel into the first tunnel.

25. The method according to claim 24 further including coupling a syringe to the third tunnel.